ATTORNEY DOCKET NO. 064441.0285

PATENT APPLICATION 10/657,648

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Jeffry S. Schepp et al.
Serial No.:	10/657,648
Filing Date:	September 8, 2003
Group Art Unit:	2825
Examiner:	Lin, Sun J.
Title:	**Network-Based Photomask Data Entry Interface and Instruction Generator for Manufacturing Photomasks**

MAIL STOP - AMENDMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

DECLARATION PURSUANT TO 37 C.F.R. § 1.131

I, the undersigned, hereby declare and state that:

1. I am over the age of 21 years, of sound mind, and competent in all respects to make this Declaration.

2. I am an inventor of the subject matter of the above-referenced continuation patent application, entitled *Network-Based Photomask Data Entry Interface and Instruction Generator for Manufacturing Photomasks*, filed on September 8, 2003 (the "Continuation Application"). The Continuation Application is a continuation of, and claims the benefit of, U.S. Patent Application No. 09/610,917, filed on July 5, 2000 (the "Parent Application"), which has been issued as U.S. Patent 6,622,295. Thus, the Continuation Application claims the priority date of July 5, 2000.

3. The Examiner rejected Claim 53 under 35 U.S.C. § 103(a) as being unpatentable over a webpage titled "Precision Online Ordering of Photoplots & Photomasks," by PHOTOPLOT STORE ("*PhotoStore*"), published online on June 13, 2000, in view of U.S. Patent 6,330,708 issued to Thomas R. Parker et al. ("*Parker*"), filed on September 17, 1998. The Examiner also rejected Claims- 27-52 under 35 U.S.C. § 103(a) as being unpatentable over *PhotoStore* in view of *Parker* and further in view of U.S. Patent 5,553,274 issued to Lars W. Leibmann ("*Leibmann*"), filed on June 6, 1995.

4. Prior to June 13, 2000, which is the publication date of the *PhotoStore* reference identified above in paragraph 3, I and the other named inventor conceived of the present invention. The subject matter of the claimed invention is described in a Microsoft Excel document named "Order Entry Beta Test.xls," attached hereto as Exhibit A, which evidences the conception of the invention. As indicated by a screenshot of the properties of the "Order Entry Beta Test.xls" document, which is included in Exhibit A, the file was created on August 30, 1999. The final version of the document (i.e., the version attached as Exhibit A) was completed around the end of September 1999. The conception of the invention is further evidenced by a draft of the Parent Application, which was sent as an attachment to an email dated May 31, 2000 from Attorneys for Applicants, and which is attached hereto as Exhibit B.

5. In the period from May 31, 2000 to July 5, 2000, when the Parent Application was filed, I along with Attorneys for Applicants worked diligently to complete and file the Parent Application. In particular, during this period, I reviewed the draft patent application sent on May 31, 2000 (included as Exhibit B) to confirm that it accurately and adequately described the invention. Attorneys for Applicants edited the draft patent application based at least on the results of my review, communicated with the other named inventors to finalize the draft patent application, and prepared the application for filing with the U.S. Patent Office. Various emails evidencing such activities to prepare and file the Parent Application are attached hereto as Exhibit C.

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PATENT APPLICATION
10/657,648

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. Further, I declare that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the Application or any patent issuing thereon.

Declaration pursuant to 37 C.F.R. § 1.131 in regard to 10/657,648.

Signed this 2 day of May, 2005.

Jeffry S. Schepp

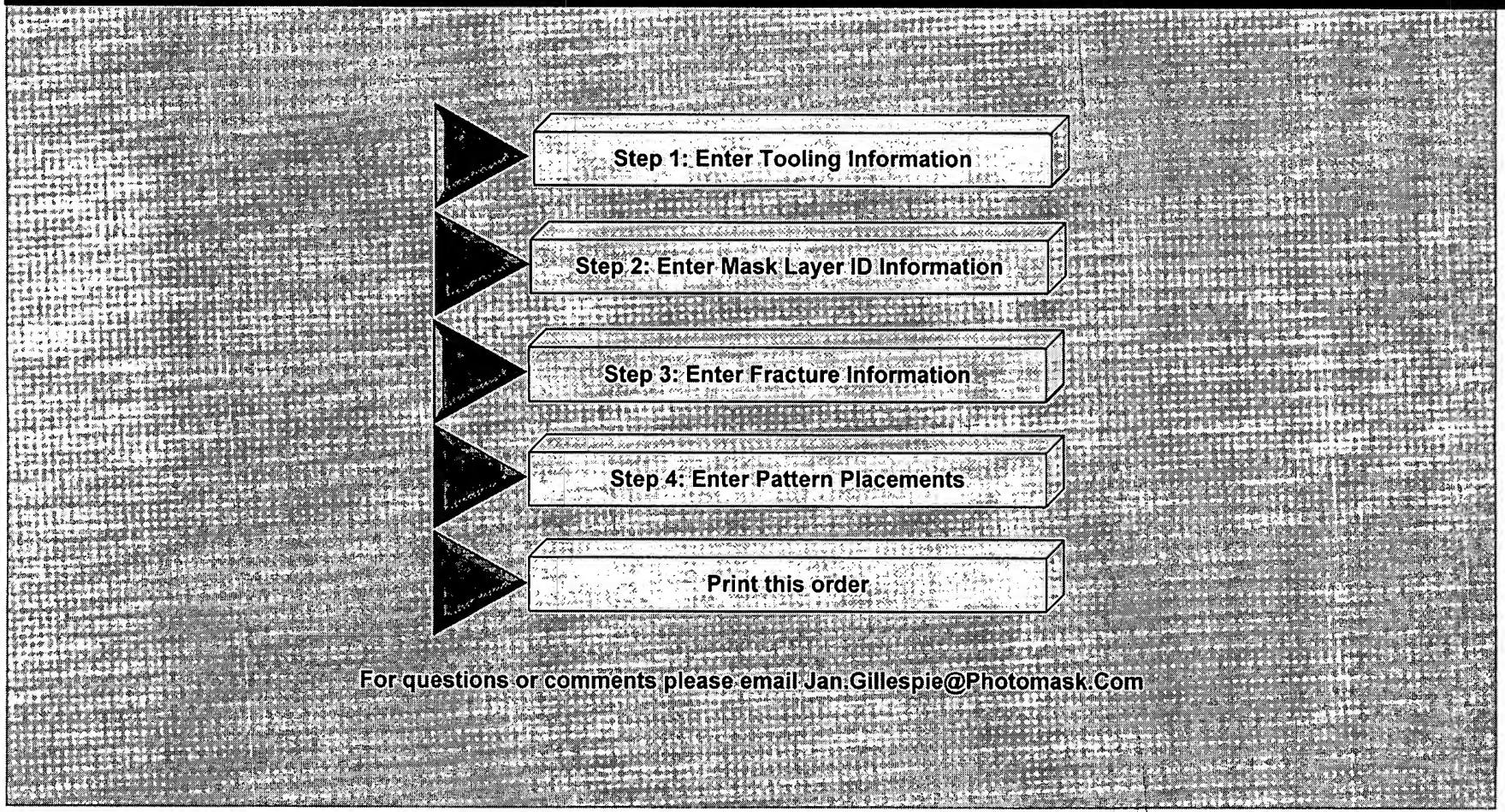
Jeffry S. Schepp

ISO 9000 CERTIFIED

Quality and Service

DuPont Photomasks, Inc

Reticle Order Form



For questions or comments please email Jan.Gillespie@Photomask.Com

DuPont Photomasks, Inc.

Order Form Information

4/29/2005 12:33

Section 1: Order Entry Data

Customer Name:	
P.O. Number:	
Device Name:	betarun
Contact:	
Phone Number	
Fax Number	

Section 2: Tooling Type

Place your mouse in the yellow cell to access the listing

5X Reticle

Other (Specify)

Section 3: Material

Place your mouse in the yellow cell to access the listing

Sodalime

Section 4: Coating

Place your mouse in the yellow cell to access the listing

Bright Chrome

% Reflectivity

Section 5: Glass Size

Place your mouse in the yellow cell to access the listing

5 X 5

Section 5: Glass Thickness

Place your mouse in the yellow cell to access the listing

90 Mils

Section 6: Q.C. Section

Defect Criteria

Kla (Die to Die)

Section 6: Documentation

Plots: We will provide 8 1/2" X 11" plots

Plot approval required? (Y/N)

Section 6: Pellicles

Pattern (Y/N)	
Glass (Y/N)	
Pellicle Frame Type	
Pattern	
Glass	

Comments/Instructions

Billing Address:

Shipping Address:

For DPI Internal Use Only

Enter data path in either vax or unix convention. Example: $DUP or /data/xxx/xxx

$DUP

	Device:	betarun	Customer								
					Data Limits				Data	Address
					Lower Left		Upper Right		Scale	Units
	Pattern Name	Database Name	Top Structure	GDS Layers	X	Y	X	Y	Out	Out
Fracture 1										
Fracture 2										
Fracture 3										
Fracture 4										
Fracture 5										
Fracture 6										
Fracture 7										
Fracture 8										
Fracture 9										
Fracture 10										
Fracture 11										
Fracture 12										
Fracture 13										
Fracture 14										
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Fracture 27										
Fracture 28										
Fracture 29										
Fracture 30										
Fracture 31										
Fracture 32										
Fracture 33										

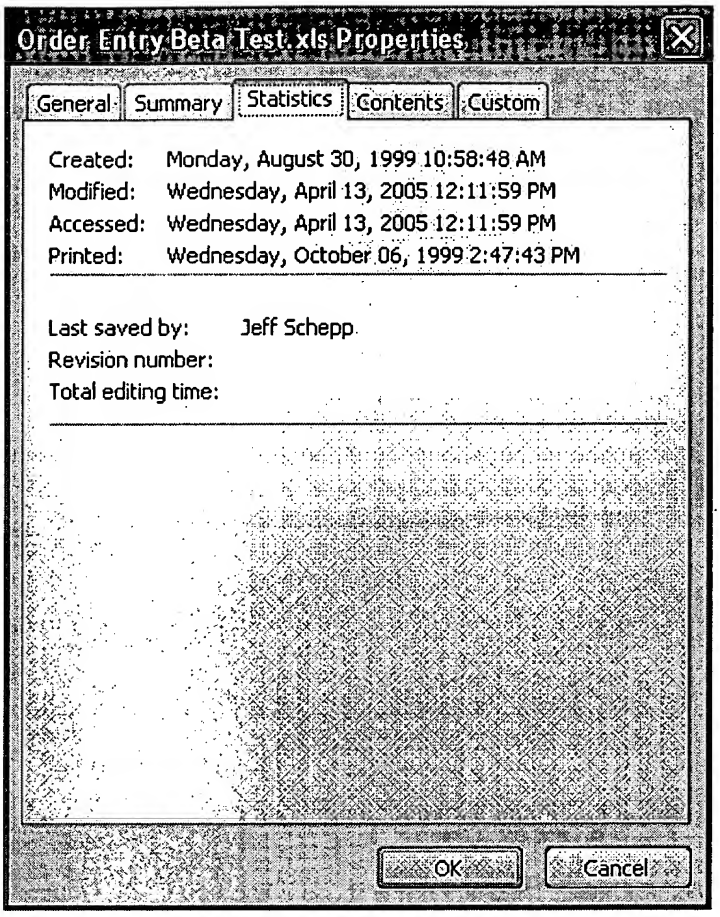
Pattern Placement Information

* Note: Placements are from center of reticle to center of pattern chrome up

Device betarun

You must select a barcode

Mask Layer Name	Pattern Name	5 X 5 Pattern Placements		CD Information			Digitized Data (Y/N)	Barcode Text Select type in yellow cell
		X	Y	Final Size	Tolerance	Range		Nikon


Order Entry Beta Test.xls Properties
General
Summary
Statistics
Contents
Custom
Created: Monday, August 30, 1999 10:58:48 AM
Modified: Wednesday, April 13, 2005 12:11:59 PM
Accessed: Wednesday, April 13, 2005 12:11:59 PM
Printed: Wednesday, October 06, 1999 2:47:43 PM
Last saved by: Jeff Schepp
Revision number:
Total editing time:
OK
Cancel

Parks, Patricia

From: Ann Livingston [alivings@mail.onr.com]
Sent: Wednesday, May 31, 2000 7:01 AM
To: Schepp, Jeff
Cc: John.Lynn@photomask.com
Subject: Patent application for web-based photomask order entry

Hello Jeff,

Attached is a first draft in Word. My secretary has not formatted it yet, but it is ready for you to review. You can forward it to the other inventors now or wait until I have incorporated your comments. I will leave that decision to you.

I notice that one of the inventors is at Athens Group. Do you know if there is an assignment in place for his contributions? Who would I talk to about this? Pls note in reviewing the draft that what I believe is his sole contribution (the billing file generator) is not in the independent claims (Claims 1 and 10). In other words, I did not make this feature central to the invention. Did he contribute to other aspects of the invention?

I am faxing the drawings to you separately. They are in rough form now -- our draftsperson will make them nice.

Pls let me know when you have reviewed the draft. Even though Robert indicated that foreign filing would not be necessary, if we file this before any public disclosure, we will still have that option.

Ann Livingston
512-894-3336

NETWORK-BASED PHOTOMASK DATA ENTRY INTERFACE AND INSTRUCTION GENERATOR FOR MANUFACTURING PHOTOMASKS

TECHNICAL FIELD OF THE INVENTION

This invention relates to the manufacture of photomasks, and more particularly to a network-based system that permits a remote customer to provide pattern design data and photomask specifications, and that uses this data to generate instructions for photomask manufacturing equipment.

BACKGROUND OF THE INVENTION

Photomasks are an integral part of the lithographic process of semiconductor manufacturing. Photomasks are quartz or glass plates that contain precision images of layers of integrated circuits. They are used to optically transfer the images to semiconductor wafers during photoresist exposure.

Photomasks require complex mathematical algorithms for their design and use sophisticated manufacturing techniques. To make a photomask, a customer, such as a chipmaker, provides the photomask manufacturer with circuit design data and photomask specifications. This data is used to generate photomask pattern data in a format appropriate for the manufacturing equipment. Each photomask is then created by using photolithographic techniques.

Conventionally, the data provided by the customer is in whatever format is convenient for the customer, based on the customer's design system. The circuit design data is typically from a CAD type system, with a design for each pattern. The data might be delivered to the manufacturer on various media, such as a floppy disk, magnetic tape, cassette, or via a modem connection. The photomask specifications might be in hardcopy form or in electronic form, on some sort of physical media delivered to the manufacturer, or delivered electronically. There is no guarantee that this customer-provided data will be complete or that it will result in a manufacturable photomask.

SUMMARY OF THE INVENTION

One aspect of the invention is a network-based method of generating instructions for use by photomask manufacturing equipment. A customer computer establishes a remote connection to wide area network, also accessible by a local network of the manufacturer. A series of order entry display screens is downloaded to the customer computer. These screens prompt the customer to enter photomask specification data, which identifies layers, patterns, placements, and fracturing data for at least one photomask. This photomask specification data is communicated to an interface computer on a local network of the photomask manufacturer. The interface computer validates the photomask specification data during the remote connection, and also delivers the photomask specification data to a command generator. The command generator generates two types of instructions in response to the photomask specification data: fracturing instructions and equipment control instructions. The fracturing instructions operate on pattern design data from the customer so as to provide fractured pattern data. Both the fractured pattern data and the control instructions may be electronically delivered to the manufacturing equipment.

An advantage of the invention is that the interface computer and the command generator operate directly in response to customer-provided photomask specification data. They do not require data input by the photomask manufacturer. The method occurs "on-line", in the sense that photomask specification data is received and processed using electronic transfers of the data. It is received in a

desired format, so that no reformatting is required for the input to the command generator.

This method of entering photomask specification data greatly reduces the time required to manufacture a photomask For example, when patterns are manually fractured in the conventional manner, the fracturing process can take up to 70 times longer than with the present invention. With the present invention, fracturing may be performed as the customer is entering order data.

At the same time, the invention ensures that the customer provides all necessary information, for both manufacturing and accounting. Information is received in a uniform format. The order data is verified to ensure that the photomask is manufacturable. The order entry process may be easily integrated with a billing system for accounting purposes.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1A illustrates a network-based system for obtaining photomask data and generating manufacturing instructions in accordance with the invention.

FIGURE 1B illustrates the method followed by the system of FIGURE 1A.

FIGURE 1C illustrates the order entry steps of FIGURE 1B.

FIGUREs 2 - 7 illustrate various display screens downloaded to the customer's computer, consistent with the order entry steps of FIGURE 1C.

FIGURE 8 illustrates a display screen for entering billing information during the billing data step of FIGURE 1B.

FIGURE 9 illustrates a validation screen for displaying the results of the validation step of FIGURE 1B.

FIGURE 10 illustrates an order summary display, which is delivered to the manufacturing plant.

DETAILED DESCRIPTION OF THE INVENTION

System Overview

FIGURE 1A illustrates a network-based system for obtaining photomask data and generating manufacturing instructions in accordance with the invention. FIGURE 1B illustrates the method performed by the system of FIGURE 1A.

Computers 102, 108, and 114 are assumed to have the processing resources and memory to implement the functions described herein. They are further assumed to have associated program memory for storing programming for those functions.

With regard to distribution of processing tasks on the computer equipment, FIGURES 1A and 1B are but one possible embodiment. For example, although FIGURE 1B illustrates Steps 120 - 124 as being all performed by a single interface computer 108, these steps could be performed on different computer equipment.

As indicated in FIGURE 1A, the customer is assumed to have a customer computer 102, as well as a circuit design computer 104 and circuit design database 106. The rest of the computing equipment shown in FIGURE 1A is that operated by the photomask manufacturer. Typically, the manufacturer's computing equipment is linked on a LAN.

Customer computer 102 provides access, via a network, to an interface computer 108. The network access may be via any LAN or WAN. For example, the network could be the Internet, and customer computer 102 could establish a connection to a web site. Various user interface screens described herein are downloaded to customer computer 102.

Interface computer 108 would receive the photomask data that the customer enters on these screens. The various network servers and other equipment will vary depending on the type of network; only the end stations are illustrated in FIGURE 1A. In the case of an Internet connection, customer computer 102 need not have special programming other than a web browser.

The customer also has a circuit design computer 104. Circuit design computer 104 stores programming for generating designs the customer's integrated circuit. It is possible that computers 102 and 104 could be the same equipment, although typically, computer 102 is a PC type computer and computer 104 is a UNIX type workstation. The customer's circuit design data is stored in the customer's design library database 106. As illustrated by Step 127 of FIGURE 1B, at some point prior to manufacture of the photomask(s), this design data is transferred to customer design database 110 for access by the manufacturer's local network.

Interface computer 108 stores programming for receiving photomask specification data from the customer via the network connection. In other words, photomask specification data is received on-line from the customer, using order entry forms that organize the data in a particular format. This data is immediately available to other computing equipment on the manufacturer's local network. Interface computer 108 also stores programming that uses the photomask specification data to design one or more photomasks that will meet all manufacturing requirements as well as the customer's specifications. Steps 120 - 124 of FIGURE 1B

illustrate an order entry process and other processes performed by interface computer 108.

Computer 108 stores the photomask specification data in photomask specification database 112. This data is accessed by command generator 114, which generates instructions that are delivered to the photomask fabrication equipment. Specifically, command generator 114 generates fracturing instructions which are delivered to fracture engine 116. Fracture engine 116 also receives pattern design data from database 110 and generates fractured pattern data. The command generator 114 also generates control instructions, which specify where and how patterns are to be written.

The fractured pattern data and the control instructions are delivered to memory accessible by the manufacturing equipment, which produces a photomask for each layer of the integrated circuit. In today's manufacturing environment, the manufacturing equipment is computer-controlled lithography equipment.

Billing file generator 118 is used to interface the photomask specification data to the manufacturer's billing system. It selects appropriate data and arranges it in a format useable by the billing system.

On-Line Entry of Photomask Specifications

FIGURE 1C illustrates a number of steps performed during Step 121 of FIGURE 1B. During this step, interface computer 108 receives photomask specification data, using a forms type order entry interface. As explained below, it is assumed that the customer has accessed a network for downloading various user interface screens. These screens

are displayed on customer computer 102, and guide the customer to enter photomask specification data.

Each of the Steps 131 - 136 of FIGURE 1C is associated with a different user interface screen. These screens are illustrated in FIGUREs 2 -7. To submit a photomask order, the customer accesses these screens in succession and enters data as prompted by each screen.

The display screens are arranged in a manner that delivers data to interface computer 108 in a form that permits computer 108 to generate appropriate instructions for that order. The screens have various interface features known to persons who use windows-type operating systems. These features include data entry boxes, pull down menus, and selection buttons and bars. Help icons permit the customer to view help information.

FIGURE 2 illustrates a log-in screen 20, which is the first screen that the customer views. Where access is via the Internet, this screen is displayed in response to the customer entering the URL of the photomask manufacturer.

Each order requires that the customer first have an account. A new-customer link 21 permits the customer to set up an account and thereby receive a username and password. At this time, the customer may also be set up for network access to customer design database 110. This permits the customer to electronically transfer circuit design data from the customer's database 106 to a database 110 maintained by the manufacturer. As explained below, this transfer need not be accomplished by the same network connection as is used to create an order.

To enter an order, the user is prompted to enter a username and password. A menu 22 permits the user to request that a new order be created.

FIGURE 3 illustrates a general tooling data screen 30. A navigation bar 30a at the top of screen 30 informs the customer of the current location within the design process and permits the customer to navigate among all screens.

An order copy box 31 permits the customer to reload an order in progress or to create a new order based on an old order. This reduces the need for the customer to re-enter data that is to be re-used for the new order.

A customer information box 32 prompts the customer to enter relevant contact information. A quality control box 33 provides a pull down menu for types of quality control, such as die to die, manual, or die to database. A documentation box 34 provides a pull down menu for selecting documentation.

A layer and pattern box 35 prompts the user to name the device, and to specify the number of layers and patterns. A tooling and materials box 37 provides pull down menus for product type, glass type, glass size and thickness, and coating. A reflectivity specification may also be entered. A pellicle box 36 permits the customer to specifies pellicle data. Various stepper data may also be entered.

A "create and forward" button 38 prompts the customer to save the information entered on screen 30 and proceed to the next screen. The information entered on screen 30 is carried forward to subsequent screens.

FIGURE 4 illustrates a layer data screen 40, which prompts the customer to enter data for each layer. Screen

40 has a layer data line 41 for only one layer. Additional lines 41 would be displayed for additional layers, such that there are as many lines 41 as there are layers specified in box 35 of screen 30. For each layer, the customer is prompted to enter a title, a barcode, a registration tolerance, and other layer information.

FIGURE 5 illustrates a pattern data screen 50. A set of pattern data lines 51 is displayed for every pattern specified in screen 30. On a first line of set 51, the customer enters a pattern name, which identifies the pattern as a primary, test, frame, or other type of pattern. The customer also specifies whether the pattern is to be fractured. On subsequent lines of set 51, for each layer, the customer specifies a number of placements, the location of the placements, and other fracturing data. Critical dimension (CD) data permits the manufacturer to verify whether the photomask meets the customer's specifications. Although there is only a single layer in the example of FIGURE 5 (and thus two lines in set 51), additional lines would be generated for additional layers.

FIGURE 6 illustrates a pattern placement screen 60. Using screen 60, the customer specifies where to place each pattern. As indicated in line 61, pattern data is carried forward from screen 50, so that screen 60 progresses through each layer and each pattern on each layer.

FIGURE 7 illustrates a pattern fracture screen 70. Again, data from prior screens is carried forward. Although FIGURE 7 illustrates data entry for a single pattern, line 71 would be repeated for each pattern, as are the data entry boxes. A database entry line 72 prompts the customer to

enter data used to identify and locate pattern data in the customer database 110. Additional boxes 73 on screen 70 prompt the customer to enter scale, GDS, and window limit data.

Processing Additional to Order Entry

Referring again to FIGURE 1A and 1B, various steps additional to customer order entry (Step 121) are illustrated. As explained below, these steps occur simultaneously with, or subsequent to, order entry.

Step 125 occurs after Step 121. The data entered by the customer during the order entry process is stored as photomask specification data in photomask specification database 112.

Step 122 is receiving billing data from the customer. This step may occur during the same network connection as Step 121. In the example of this description, a billing data screen immediately follows screen 70.

FIGURE 8 illustrates a billing data screen 80, used to receive billing data for Step 122. The customer is prompted to enter various information for use in billing for the photomask(s).

Step 123 is a validation step, performed after Step 121. It may be performed while the customer is still on-line. Computer 108 processes the order data to ensure that it is valid. Examples of validation techniques include ensuring that the customer has entered all required data during Step 120. As another example, customer data might be checked to ensure that specified patterns will fit on the layer.

FIGURE 9 illustrates a validation screen 90. Screen 90 indicates that Step 123 has been performed. If one of the validation tests of Step 123 had failed, the customer would be informed with a different message in screen 90 and given an opportunity to return to the screen whose data caused the lack of validity, so the error could be corrected.

FIGURE 10 illustrates an order summary screen 100, which is delivered to the plant that is to produce the photomask(s). An order summary may also be sent to the customer computer 102. Screen 100 may be delivered electronically or printed and delivered in hardcopy form.

In Step 124, certain items of the order entry data are selected and arranged for use by a billing system. For example, the order data may be formatted as a "semi file", which complies with a semiconductor industry standard for order information. A special billing data generator 118 may be used for this task.

Step 126 is performed as the customer inputs data (during Step 121). During Step 126, command generator 114 receives the fracturing data entered into screen 70. It uses this data, as well as fracturing algorithms stored in its program memory, to generate fracturing instructions.

Fracturing instructions for a particular set of patterns are sometimes referred to as a "cinc file". The following instructions represent a portion of sync file, and describe a single pattern.

[see insert]

A complete sync file would have a similar description for each pattern.

The automatic generation of fracturing instructions eliminates the errors associated with manual input. The fracturing instructions may be generated "on-line" as the customer enters pattern and fracture data. As stated above in connection with FIGUREs 1A and 1B, the fracturing instructions are used in conjunction with the customer's design data to create photomask patterns recognizable by the manufacturing equipment.

In Step 127, command generator 114 receives the photomask specification data from database 112. It uses this data to generate instructions for the manufacturing equipment. The result is a set of computer instructions that will cause the patterns to be written on the photomask plate. These instructions are sometimes referred to as a "job deck".

In Step 128, the customer's circuit design data is delivered to the manufacturer. If the design data is sent in electronic form, it may be sent over a connection different from that of the network used for order entry. For example, a secure FTP file transfer could be used. The design data is stored in a customer database 110.

Other Embodiments

Although the present invention has been described in detail, it should be understood that various changes, substitutions, and alterations can be made hereto without departing from the spirit and scope of the invention as defined by the appended claims.

WHAT IS CLAIMED IS:

1. A computer network for generating instructions for use by photomask manufacturing equipment, comprising:

an interface computer accessible to a remote customer computer via a remote network connection, and during the network connection, the interface computer operable to perform the following tasks: receive photomask specification data from the customer computer, validate the photomask specification data, and download validation results to the customer computer;

wherein the photomask specification data at least identifies layers, patterns, placements, and fracturing data for at least one photomask;

a photomask specification database in communication with the interface computer, operable to store the photomask specification data;

a command generator in communication with the photomask specification database, operable to generate fracturing instructions and control instructions in response to the photomask specification data;

a customer design database that stores design data for the photomask; and

a fracture engine that receives the fracturing instructions and the design data and uses this data to generate fractured pattern data.

2. The network of Claim 1, wherein the remote network connection is an internet connection.

3. The network of Claim 1, wherein the customer design database has a communications interface for receiving design data from the customer in electronic form.

4. The method of Claim 3, wherein the design data is received during the same network connection as the photomask specification data.

5. The network of Claim 1, further comprising a billing data generator that selects billing data from the photomask specification data and arranges the billing data in a format suitable for a billing system.

6. The network of Claim 5, wherein the billing data generator arranges the billing data as a semi file.

7. The network of Claim 1, wherein the command generator is further operable to deliver the control instructions to memory accessible by the manufacturing equipment.

8. The network of Claim 1, wherein the fracture engine is further operable to deliver the fractured pattern data to memory accessible by the manufacturing equipment.

9. The network of Claim 1, wherein the fracturing instructions are in the form of a cinc file.

10. A network-based method of generating instructions for use by photomask manufacturing equipment, comprising the steps of:

downloading a series of display screens to a customer computer via a remote network connection, each of the network screens operable to prompt the customer to enter photomask specification data;

wherein the photomask specification data at least identifies layers, patterns, placements, and fracturing data for at least one photomask;

receiving the photomask specification data from the customer computer via the remote network connection, at local computing equipment on a local network of the photomask manufacturer; and

using the local computing equipment to perform the following tasks: to validate the photomask specification data during the remote network connection; to generate fracturing instructions in response to the photomask specification data; to receive pattern design data from the customer; to use the fracturing instructions and the pattern design data to generate fractured pattern data; and to generate control instructions for the manufacturing equipment.

11. The method of Claim 10, wherein the remote network connection is an internet connection.

12. The method of Claim 10, wherein the local computing equipment receives the pattern design data from the customer in electronic form.

13. The method of Claim 12, wherein the design data is received during the same network connection as the photomask specification data.

14. The method of Claim 10, wherein the downloading step is further performed by downloading a screen operable to prompt the use to enter billing data, and further comprising the steps of arranging the billing data in a format suitable for a billing system, and delivering the billing data to the billing system.

15. The method of Claim 10, wherein the screens comprise at least a layer data screen and a pattern data screen and wherein the pattern data screen lists layers based on data provided to the layer data screen.

16. The method of Claim 10, wherein the screens comprise at least a layer data screen and a pattern placement screen and wherein the pattern placement screen lists layers based on data provided to the layer data screen.

17. The method of Claim 10, wherein the screens comprise at least a pattern data screen and a fracture screen, and wherein the fracture screen lists patterns based on data provided to the pattern data screen.

18. The method of Claim 10, wherein the local computing equipment further delivers the fractured pattern

data and the control instructions to the manufacturing equipment.

19. The method of Claim 10, wherein the local computing equipment comprises an interface computer, a command generator, and a fracture engine, implemented on at least one computer.

20. The method of Claim 10, wherein the local computing equipment further generates a billing file for use by the manufacturer's billing system.

[title]

ABSTRACT OF THE DISCLOSURE

A computer network for generating instructions for photomask manufacturing equipment, based on photomask specification data input by a customer. A series of order entry screens are downloaded to a remote customer's computer, typically via an internet connection. The customer is prompted to enter photomask specification data, which is delivered to computing equipment on the manufacturer's local network. The manufacturer's computing equipment verifies the photomask specification data, and uses this data to generate fracturing instructions and equipment control instructions. The fracturing instructions, together with pattern design data from the customer, are delivered to a fracture engine, which provides fractured pattern data. The control instructions and the fractured pattern data may then be electronically delivered to the manufacturing equipment.

Parks, Patricia

From: Ann Livingston [alivings@mail.onr.com]
Sent: Monday, June 05, 2000 10:31 AM
To: Schepp, Jeff
Subject: Patent application

Hi Jeff,

I incorporated the info you sent about validation. Just what I wanted. Then I added some claims.

I have sent the draft to my secretary to format and tidy up. She will overnight you a hard copy with papers to sign. The you can let me know if you need additional changes or just sign and return the papers.

I need to get an assignment from Thomas Cogdell to Athens Group. Then from Athens Group to DPI. Can I call or email Thomas for information I need?

Ann Livingston
512-894-3336

Parks, Patricia

From: Ann Livingston [alivings@mail.onr.com]
Sent: Monday, June 05, 2000 9:38 PM
To: thomas_cogdell@athensgroup.com
Cc: Schepp, Jeff
Subject: DPI patent application

Hello Mr Cogdell,

I am a patent attorney and have prepared a patent application for DPI for the web-based photomask order entry system. You have been listed as an inventor.

I will be sending you a draft application for your review, as well as some documents to sign. Two of these documents are to formalize DPI's ownership of the invention. One document is an assignment from you to the Athens Group and another is an assignment from the Athens Group to DPI.

To complete the patent application, I need your residence address, country of citizenship. Also, the name of a representative of Athens Group who can sign the assignment to DPI.

Will you please email this information to me? Please call if you have questions.

Ann Livingston
512-894-3336

Parks, Patricia

From: Garbade, Crystle
Sent: Tuesday, June 13, 2000 2:19 PM
To: Schepp, Jeff; jan.gillespie@photomask.com
Subject: Patent Application

My name is Crystle Garbade. I work with Ann Livingston at Baker Botts. She has been working with you preparing the patent application entitled "Network-Based Photomask Data Entry Interface and Instruction Generator for Manufacturing Photomasks". I am preparing the Declaration and Power of Attorney and Assignment documents for this application which will need your signature. For these documents I need your full legal name (including middle initial, if any), home street address and citizenship. Will you please forward this information to me at your earliest convenience?

Thank you.

Crystle Garbade
Legal Secretary
Baker Botts L.L.P.
512.322.2539
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June 15, 2000

Ann C. Livingston
512.322.2634
FAX 512.322.8325
ann.livingston@bakerbotts.com

VIA HAND DELIVERY

Mr. Jeffry Schepp
DuPont Photomasks
131 Old Settlers Boulevard
Round Rock, Texas 78664

Re: U.S. Patent Application entitled ***"Network-Based Photomask Data Entry Interface and Instruction Generator for Manufacturing Photomasks"***
Our File: 064441.0211

Dear Jeff:

I enclose a final draft of the above-identified application for patent, which has been revised to incorporate your comments as well as Jan's comments. A copy of the drawings is also enclosed. Will you please give a copy of the patent and drawings to Jan for her review? The application should now be ready for execution and filing in the United States Patent and Trademark Office (PTO).

Please carefully review the application. If it accurately and adequately describes the invention, you and Jan need to execute the "Declaration and Power of Attorney" and "Assignment" documents, signing your names exactly as they are typewritten and dating each document *(note that the Assignment document needs to be dated twice)*. If any minor changes to the application are necessary, they should be made and such changes must be initialed and dated by all of the inventors, in the side margin closest to the changes, before signing the Oath. If major changes are necessary, or if you have any questions, please call me. Also, the application must disclose the best mode of carrying out the invention; please let me know if it does not.

Please note that as a portion of the Declaration, you are acknowledging your duty to disclose cited references to the PTO. Such references includes relevant patents and printed publications, information concerning public use of methods or apparatus related to your invention, and information on public use or sales of your own invention (or related methods or apparatus) made more than a year ago. Your failure to disclose such references may invalidate any patent issuing on the application.

Please return the application, executed Declaration and Power of Attorney and Assignment to me in order that we may file the application with the PTO.

Should you have any questions concerning this matter, please do not hesitate to call me at 322.2634.

Sincerely,
BAKER BOTTS L.L.P.

Ann C. Livingston

ACL/clg
Enclosures

☒ DELIVERY
☐ PICK UP
☐ ROUND TRIP

☐ ASAP
☐ 1 HOUR
☐ 2 HOUR
☒ 4 HOUR

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MESSENGER REQUEST

June 15, 2000
DATE

TICKET #

Deliver To:	Mr. Jeffry Schepp DuPont Photomasks 131 Old Settlers Boulevard Round Rock, Texas 78664
Phone:	310.6527
Special Instructions:	Please leave package with receptionist.
Client Name:	DUPONT PHOTOMASKS, INC.
Matter Name:	Network Based Photomask System - Patent
Billing No:	064441.0211

Requester:	Crystle Garbade
Extension:	2634
Attorney Name:	Ann Livingston
Employee No.	01693

☒ Austin ☐ Dallas ☐ Houston ☐ D.C. ☐ New York

Return recorded material to: Crystle Garbade

Signature required?
☐ Yes ☒ No

Leave if no response?
☐ Yes ☒ No

Signature (B&B Mailroom):

Pick-up time ☐ AM ☐ PM

Time completed ☐ AM ☐ PM

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